REMARKS

This is in response to the Office Action dated December, 20, 2005, in which Claims 1, 2 and 8-30 were rejected under 35 U.S.C. 103(a) and Claims 3-7 were allowable if rewritten in independent form. The rejections are respectfully traversed according to the following remarks, and it is respectfully submitted that all the pending claims is patentable over the cited reference.

Claims 1, 2 and 8-25

Claims 1, 2 and 8-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Velsko (6,421,166).

Claim 1

Regarding Claim 1, the Examiner has indicated a view that Visko discloses an integrated optical parametric oscillator comprising an input face (Fig. 1, #10), an optical-parametric-oscillation region (col. 4, lines 15-17, area between mirrors 20 and 22)", a grating (Fig. 2, #30, lines 12-), a reflecting plane (Fig. 1, #20), an ultra-fine-steering region (Fig. 1, #14; Col. 3, lines 56-); and an output face (Fig. 1, #22) except for the positioning of the beam deflector (steering region). The Examiner further cited *In re Japikse*, 86 USPQ 70 and indicated a view that it would have been obvious to one of ordinary skill in the art at the time the invention was made to reposition the beam deflector, since it has been held that rearranging parts of an invention involves only routine skill in the art.

As understood, Velsko uses an acousto-optic beam deflector 14 to deflect the pump beam 12 with a deflection angle θ_p which determines the wavelengths λ_r and λ_i of the signal (resonated) beam and the idler beam (Fig. 1, #14, col. 3, line 56 to col. 4, line 15). Should the deflector 14 be repositioned to between the reflecting plane and the grating, the pump beam 12 will not be deflected, and the deflection angle θ_p cannot be tuned. As a result, the rapid tuning of the wavelengths λ_r and λ_i cannot be performed as desired. Evidently, **shifting the position** of the deflector 14 **would have inevitably modified the operation of the optical parametric oscillator disclosed by Velsko. More importantly, shifting the position of the deflector 14 actually renders Velsko unsatisfactory for its intended purpose,** that is, to rapid tune the wavelength λ_r and λ_i by tuning the deflection angle θ_p.

Therefore, there is no motivation for one of ordinary skill in the art for the modification proposed by the Examiner.

As understood, *In re Japikse*, 86 USPQ 70 held that claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch **would not have modified the operation** of the device. As discussed above, the repositioning of beam deflector 14 would inevitably modify the operation of Velsko, the case *In re Japikse*, 86 USPQ 70, has thus been inappropriately cited for supporting the rationale of "rearranging parts of an invention involves only routine skill in the art" as proposed by the Examiner.

In addition, according to MPEP 2144.04, "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device" *Ex Parte Chicago Rawhide Mfg. Co.,* 223 USPQ 351, 353 (Bd Pat. App. & Inter. 1984). The rejection rationale is thus respectfully traversed because there appears to be lack of motivation for one of ordinary skill in the art to repositioning the beam deflector as proposed by the Examiner.

In addition to the ultra-fine steering region, Velsko discloses a grating in the form of a periodically poled OPO region (QPMC) to vary the required value of the pump-offset angle, and the angle of tilt is chosen to maximize beam overlap over the desired tuning range of the device. As the grating itself is a part of the OPO region, Velsko fails to teach the grating **along an optical of the signal beam and the idler beam.** Further, the grating is **inoperative to diffract the signal beam**.

The reference further fails to teach the input face (Fig. 1, #10) to be anti-reflective to the pump beam and reflective to the signal and idler beam as claimed. As a matter of fact, as the input face #10 is arranged in a position where the signal and idler beams have not been created, there appears to be no motivation or suggestion that such input face should be reflective to the signal and idler beams.

As Velsko fails to teach every element as claimed, and there is no motivation or suggestion for modifying Velsko to incorporating all elements as claimed, a *prima facie* case

of obviousness is not established, and the rejection over Claim 1 and its depending Claims 2 and 8-10 are respectfully traversed.

Claim 2

Claim 2, was rejected under 35 U.S.C. 103(a) as being unpatentable over Velsko in view of Levinos (4,189,652).

In the teaching (col. 7, lines 1-9) the Examiner relied upon for the teaching of line selection, Velsko disclsoes:

In the case where the mirrors allow both wavelengths to oscillate, it is ***possible that single wavelength selection*** *can be accomplished by selective seeding. More generally, a tunable intracavity filter could be used to select the desired branch. ...*"

As understood, Velsko discloses that even when both the wavelengths of the signal and idler beams are oscillating within the OPO region, one can select only of them by selective seeding. Clearly, **the line selection is between the signal beam and the idler beam, not between the signal beam itself.** That is, Velsko fails to disclose the ultra-fine-steering region operative to select a narrow line of the signal beam. Further, the selection is not performed by steering the optical path of the signal beam.

Levinos, again, teaches a grating G within the OPO cavity, while neither of the output beams 2.87 μm and 16 μm of the OPO, that is, the signal beam and the idler beam, will be further steered. Therefore, both Velsko and Levinos fail to teach selection of a narrow line between the signal beam itself and performing such selection by steering the optical path of the signal beam.

As the cited references, individually or in combination, fail to teach every element as claimed in Claim 2, the Examiner fails to meet with the burden of establishing a *priam facie* case of obviousness, the rejection is respectfully traversed.

Claim 10

The Examiner has indicated a view that Velsko discloses the integrated OPO wherein the grating includes a holographic grating with 300 grooves/mm (col. 2, line 50-). The Applicant cannot find any teaching in col. 2, lines 50-67 disclosing the holographic grating at all. Therefore, the rejection is respectfully traversed because the teaching relied upon fails to teach every element as claimed in Claim 10.

Claim 11

The integrated optical parametric oscillator as claimed in Claim 11 of the present application comprises a nonlinear optical bulk material in which a locally periodically-poled region and a fine-steering region subjected to an electric field are formed.

Velsko teaches an electro-optic deflector 14 (Claim 14) as a separate device from the nonlinear optical bulk material. Velsko fails to teach **the nonlinear optical bulk material in which the fine-steering region is formed**.

As the cited reference fails to teach every element as claimed, a *prima facie* case of obviousness is not established, and the rejection over Claims 11-17 is respectfully traversed.

Claim 12

Velsko fails to teach a grating **between the locally periodically poled region and the steering region.**

Claim 13

Velsko teaches a deflector 14 operative to deflect the pump beam with a predetermined angle. As understood, all wavelength components will be deflected with such angle. The deflector is inoperative to steer **a selected one of the wavelength components of the diffracted signal beam**.

Claim 14

As discussed, what Velsko teaches is a grating for diffracting the pump beam, not the grating for diffracting the signal beam. Further, the only deflector 14 disclosed by Velsko is intended to deflect the pump beam, not the signal beam diffracted by the grating. Therefore, Velsko further fails to teach the ultra-fine steering region to **steer the diffracted signal beam**. Without steering the diffracted signal beam, no wavelength components will be selected therefrom. As a consequence, Velsko fails to teach a reflecting plane **operative to reflect the steered wavelength component (of the diffracted signal beam) to the grating.**

Claim 18

Claim 18 of the current application includes a nonlinear optical bulk crystal that comprises an OPO region, a grating, and a fine-steer region.

Velsko teaches an OPO with a periodically poled section serving as a grating for maximize the beam overlap over the desired tuning range of the device. The OPO is inoperative to diffract the signal beam converted from the pump beam. Therefore, Velsko fails to teach the grating diffracting the signal beam. Velsko also fails to teach the grating (OPO) being operative to reflect a portion of the signal and idler beams converted thereby. In addition, by specifically disclosing the deflector 14 being separate element from the nonlinear optical bulk crystal (QPMC), Velsko further fails to teach the nonlinear optical bulk comprising a fine-steering region. Velsko further fails to teach the fine-steering region operative to generating an optical difference **of the signal and idler beams**.

As Velsko fails to teach every element as claimed and shows no desirability of such elements, a *prima facie* case of obviousness is not established, and the rejection over Claims 16-30 is respectfully traversed.

Claim 26

In Claim 14 of Velsko, the electric-optic beam deflector is not a part of the nonlinear optical bulk crystal. Therefore, even if the electric-optic beam deflector is subjected to an electric field, there is no showing that the nonlinear optical bulk crystal (QPMC) will be subjected to an electric field at all.

Claim 27

The Examiner recognizes that Velsko fails to teach the tunable, narrow-line laser system operative to generate a first power to seed a laser or an OPO with a second power higher than the first power. However, the Examiner has indicated a view that Geiger (5,159,487) does teach a narrow-line laser system operative to generate a narrow-line output with a first power to seed a laser or an OPO with a second power higher than the first power (Col. 3, lines 9-12). What is disclosed in col. 3, lines 9-12 is as:

"Alternate techniques of seeding include the use of a tunable diode laser, a second low power OPO and a second OPO using a Faraday Anomalous Dispersion Optical Filter (FADOF). Techniques for angle tuning the OPO stack and compensating for walkoff are disclosed."

Nowhere does the above teaching cited by the Examiner teach using the tunable, narrow-line laser system for generating a **lower output to seed a laser or OPO with a higher output.**

In view of the foregoing, all the pending claims are believed allowable, and the application is believed to be in condition for allowance. Issuance of a Notice of Allowance is therefore respectfully requested. Should the Examiner have any suggestions for expediting allowance of the application, please contact applicant's representative at the telephone number listed below.

If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

Date: Feb 1, 2006 By: [signature]

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